

Map Data Cube

Beginner Edition

What colors
do you
see the most?
Least?

Map Data Cube

Where on
Earth is
this map?

Map Data Cube

What do
the colors
mean?

Map Data Cube

When was
the data
on this map
collected?

Map Data Cube

What is a
question you
have about
the map?

Map Data Cube

What area/s
have the
highest
value? Lowest?

Map Data Cube





Map Data Cube Questions:



1. What colors do you see the most? Least?

- A. What color seems to show the most? What does this mean?
- B. What color do you not see very much? What does this mean?

2. Where on Earth is this map?

- A. What (hemisphere/continent/country/state/city) do you see?
- B. Is your school shown on the map? If so, where is it?

3. What do the colors mean?

- A. What science variable is shown by the range of colors?
- B. The color with the biggest value/number is _____.
- C. The color with the smallest value/number is _____.
- D. The color in the middle is _____. Its value is _____.

4. What areas of the map have the highest value? Lowest?

- A. What area/s have the highest values? What does this mean?
- B. What area/s have the lowest values? What does this mean?

5. When was the data on this map collected?

- A. What date/s are represented on this map?
- B. What word is found with the title? daily, weekly, monthly, yearly.

6. What question/s do you have about the map?

- A. How does...?
- B. I wonder if ...?
- C. How is _____ the same as? Different than?
- D. How many...? How long...? How often...?

Graph Data Cube

Intermediate Edition

Who
Cares?

Glue



Graphed Data Cube

Glue

What is the
independent
variable?



Graphed Data Cube

Glue

Brainstorm a
question that you
can answer
using these data.



Graphed Data Cube

What is the
dependent
variable?



Graphed Data Cube

Glue

Write a hypothesis
statement
(or claim)
using these data.



Graphed Data Cube

Identify the units
of the variables
(Independent
& Dependent).



Graphed Data Cube





Graph Data Cube Questions:



1. Who Cares?

- A. Brainstorm who would be interested in the data presented in this graph (i.e., farmers, snow skiers, etc.).
- B. Why do you think these data are important to this community?

2. What is the Independent Variable?

- A. How does the amount of this variable affect the dependent variable?
- B. What variable is causing the change?
- C. What is the range of the values of this variable?

3. What is the dependent variable?

- A. What variable changes as a result of being dependent upon a different one?
- B. What is the range of the values of this variable?

4. Brainstorm a question that you can answer using these data.

- A. How does...
- B. I wonder if ...
- C. How is _____ the same as? Different than?
- D. How many...?
- E. How long...?
- F. How often...?

5. Write a hypothesis statement (or claim) using these data.

- A. Write a testable statement or claim about the two variables that offers an explanation of what happened in the past to explain our what we observe. (e.g., "If _____, then _____.")
- B. What qualitative evidence do you have to support your claim?
Quantitative?
- C. How does the evidence support the claim? How do these relate?

6. Characterize the Graph.

- A. What are the labels of the two axes?
- B. What are the scales of the two axes?
- C. Identify the units of the two variables.

Data Cube

Advanced
Edition

Collect the
Data

Glue

Data Cube

Glue

Analyze the
Data

Data Cube

Glue

Describe
the
Data

Data Cube

Assess the
Data Values

Data Cube

Glue

Create
Questions
Using the
Data

Data Cube

Apply the
Data

Data Cube





Data Cube Questions:



1. Summarize the data:

- A. What is the scientific name of the variable?
- B. What is the range of the data?
- C. In what sphere of the Earth System does this variable belong?

2. Describe the Data: (OK to use outside resources.)

- A. What instrument/s collected these data?
- B. What platform (plane, rocket, satellite, etc.) supports the instrument that collected these data?
- C. What countries are involved in this mission?
- D. How frequent was the data collected?
- E. What are the units of the data?

3. Analyze the Data:

- 1. What geographic area on Earth do the data represent?
- 2. What time range do these data represent?
- 3. What are the limits of these data? What area and time data would you like to add to this graph that may be missing?

4. Assess the Data Values:

- A. What are the units of the data reported?
- B. What is the numerical range of the data?
- C. What is the Average? Median? Mode?
- D. Are there any outliers? If so, what are they? Why don't they meet your expectation?

5. Create Research Questions Using the Data:

- A. Identify one question related to these data that you are interested in researching.
- B. Identify another scientific variable that you would like to evaluate with these data.
- C. How do you think this area compares to other geographic provinces (i.e., coastal plain, highlands, etc.) in your region?

6. Apply the data:

- A. What science questions do these data help us understand?
- B. Describe how you may use these data to explain a scientific phenomenon.
- C. How is Technology connected to these data?
- D. How is Engineering connected to these data?

Graph Data Cube

Advanced
Edition

Describe
Patterns or
Cycles

Glue

Graph Data Cube

Glue

Describe
Longer-term
trends

Graph Data Cube

Glue

Summarize
the
Graph

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Identify a
Relationship
Between
2 Variables

Graph Data Cube

Glue

Summarize
Short-term
trends

Graph Data Cube

Evaluate
the
Graph

Graph Data Cube





Graph Data Cube Questions:



1. Summarize the graph:

- A. What variable does this graph represent?
- B. What variable is represented on the x-axis?
- C. What variable is represented on the y-axis?
- D. What are the units of measurement for x and y axes?
- E. What is the range of the units of measurement for x and y axes?
- F. If this graph represents a geographic location, identify this location on a map or globe.

2. Describe Patterns or Cycles:

- A. Do the data repeat in recognizable ways? Explain.
- B. What kinds of patterns do you see in the distribution of the data?
- C. How do the patterns you see in the graph relate to other things you know?

3. Identify a Relationship Between Two Variables:

- A. Describe the association or relationship of the variables: positive, negative, or none.
- B. Brainstorm one variable that you predict to be directly proportional. Explain.
- C. Brainstorm one variable that you predict to be inversely proportional. Explain.

4. Describe Longer-term trends:

- A. How does the average change over time on the scale of years to decades?
- B. Describe any pattern you see as you observe data over years to decades.

5. Summarize Short-term trends:

- A. What is the mean over the period of time to the scale of days, weeks, months?
- B. What general trend did you notice in your data?

6. Assess the Graph Values:

- A. What is the numerical range of the data? Mean? Median? Mode?
- B. How is the mean different from the mode?
- C. Are there any outliers? If so, what are they?